

IN THE CLAIMS

The claim are amended as follows:

1. (Previously amended) A packet processor comprising:
 - a control unit having a data input bus;
 - at least one encryption processing unit;
 - a first authentication processing unit;
 - a second authentication processing unit;
 - a local data bus, independent of the data input bus to the control unit, coupling the control unit to each of the encryption and authentication processing units; and
 - a second data bus from the encryption processing unit to each authentication processing unit, including a data bus from the first authentication processing unit to the second authentication processing unit.
2. (Previously amended) A packet processor as recited in claim 1, wherein said data input bus of the control unit is coupled to a processor bus, and wherein each of said encryption and authentication processing units comprises a data input bus coupled to the processor bus.
3. (Previously amended) A packet processor as recited in claim 1, wherein said data input bus of the control unit is coupled to a processor bus and each of said encryption and authentication processing units comprises a data input bus to the processor bus and means for reading and writing data on the processor bus.

4. (Previously amended) A packet processor as recited in claim 1, wherein said second data bus comprises a daisy-chain connection between the encryption and authentication processing units.

5. (Currently amended) A method of processing data packets comprising:

coupling a control unit to a first data bus;

receiving first and second data packets in the control unit from the first data bus;

providing a plurality of processing units in data communication with the control unit over a second data bus, independent of the first data bus, said processing units including at least one encryption processing unit and at least one authentication processing unit;

providing data of the first data packet from the control unit to said at least one encryption processing unit ~~one of the processing units~~, over the second data bus;

processing said data from the first data packet with said at least one encryption processing unit ~~one of the processing units~~ to provide output data for the first data packet from said at least one encryption processing unit ~~one of the processing units~~;

communicating said output data for the first data packet from said at least one encryption processing unit ~~one of the processing units~~ to said at least one authentication processing unit ~~another of the processing units~~ for further processing; and

providing data from the second data packet to said at least one encryption processing unit and processing the data from the second data packet in the at least one encryption processing unit ~~one of the processing units~~, while

said at least one authentication processing unit ~~other processing unit~~ further processes the output data for the first data packet.

6. (Previously amended) A method as recited in claim 5, wherein said one of the processing units comprises an encryption processing unit and said other of said processing units comprises an authentication processing unit.

7. (Previously amended) A method as recited in claim 5, wherein said at least one authentication processing unit comprises a first and second authentication processing units.

8. (Original) A method as recited in claim 5, wherein said step of communicating the output data from one of the processing units to another of the processing units comprises communicating said output data over a daisy-chain connection between said processing units.

9. (Previously amended) A method of processing data in a computer, the method comprising the steps of:

performing encryption on a first data packet within an encryption processing unit; and

after completion of the encryption of the first data packet,

performing authentication of the first data packet within at least one authentication processing unit connected to the encryption processing unit by a data bus, and

performing encryption of a second data packet within the encryption processing unit prior to completion of authentication of the first data packet.

10. (Original) The method of claim 9, wherein the authentication is a first authentication, further comprising the step of performing a second authentication on the first data packet of data.

11. (Original) The method of claim 10, wherein the first authentication is performed on the encrypted first data packet.

12. (Original) The method of claim 10, wherein the first authentication appends data to the encrypted first data packet.

13. (Original) The method of claim 12, wherein the second authentication is performed on the encrypted first data packet and the appended data.

14. (Original) The method of claim 10, further comprising the step of performing the encryption of the second data packet after beginning the second authentication of the first data packet.

15. (Previously amended) A method of processing data in a computer, the method comprising the steps of:

encrypting a first data packet with an encryption processing module;

authenticating the encrypted first data packet with a first authentication processing module;

encrypting a second data packet with the encryption processing module while authenticating the first data packet with the first authentication processing module connected to the encryption processing module by a data bus; and

authenticating the second data packet with the first authentication processing module.

16. (Previously amended) An apparatus for processing data, comprising:

a computer having a data storage device connected thereto, wherein the data storage device stores a data;

one or more computer programs, performed by the computer, for performing encryption on a first data packet within an encryption processing unit, and, after completion of the encryption of the first data packet, performing authentication of the first data packet in at least one authentication processing unit connected to the encryption processing unit by a data bus, and performing encryption of a second data packet within the encryption processing unit prior to completion of authentication of the first data packet.

17. (Original) The apparatus of claim 16, wherein the authentication is a first authentication, further comprising means for performing a second authentication on the first data packet of data.

18. (Original) The apparatus of claim 17, wherein the first authentication is performed on the encrypted first data packet.

19. (Original) The apparatus of claim 17, wherein the first authentication appends data to the encrypted first data packet.

20. (Original) The apparatus of claim 19, wherein the second authentication is performed on the encrypted first data packet and the appended data.

21. (Original) The apparatus of claim 17, further comprising the means for performing the encryption of the second data packet after beginning the second authentication of the first data packet.

22. (Previously amended) An apparatus for processing data, comprising:

a computer having a data storage device connected thereto, wherein the data storage device stores a data;
one or more computer programs, performed by the computer, for encrypting a first data packet with an encryption processing module, authenticating the encrypted first data packet with a first authentication processing module connected to the encryption processing module by a data bus, encrypting a second data packet with the encryption processing module while authenticating the first data packet with the first authentication processing module, and authenticating the second data packet with the first authentication processing module.

23. (Previously amended) An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for processing data, the method comprising the steps of:

performing encryption on a first data packet with an encryption processing unit; and

after completion of the encryption of the first data packet,

performing authentication of the first data packet in at least one authentication processing unit connected to the encryption processing unit by a data bus, and

performing encryption of a second data packet within the encryption processing unit prior to completion of authentication of the first data packet.

24. (Original) The article of manufacture of claim 23, wherein the authentication is a first authentication, further comprising the step of performing a second authentication on the first data packet of data.

25. (Original) The article of manufacture of claim 24, wherein the first authentication is performed on the encrypted first data packet.

26. (Original) The article of manufacture of claim 24, wherein the first authentication appends data to the encrypted first data packet.

27. (Original) The article of manufacture of claim 26, wherein the second authentication is performed on the encrypted first data packet and the appended data.

28. (Original) The article of manufacture of claim 24, further comprising the step of performing the encryption of the second data packet after beginning the second authentication of the first data packet.

29. (Previously amended) An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for processing data, the method comprising the steps of:

encrypting a first data packet with an encryption processing module;

authenticating the encrypted first data packet with a first authentication processing module connected to the encryption processing unit by a data bus;

encrypting a second data packet with the encryption processing module while authenticating the first data packet with the first authentication processing module; and

authenticating the second data packet with the first authentication processing module.

30. (Previously amended) A method of processing data packets comprising:

coupling a control unit to a first data bus;

receiving a first data packet in the control unit from the first data bus;

providing a plurality of processing units in data communication with the control unit over a second data bus, independent of the first data bus, said processing units including at least one encryption processing unit and at least one authentication processing unit;

providing data of the first data packet from the control unit to multiple processing units, over the second data bus;

processing said data from the first data packet with said multiple processing units in parallel.

31. (Previously amended) A method as recited in claim 30, wherein said plurality of processing units comprises at least one encryption processing unit and a plurality of authentication processing units.

32. (New) A method as recited in claim 5, wherein said at least one authentication processing unit performs an integrity check of said output data.

33. (New) A method as recited in claim 32, wherein said at least one authentication processing unit comprises an HMAC core.

34. (New) A method as recited in claim 32, wherein said integrity check is performed using HMAC- key hashing.

35. (New) A method of processing data packets comprising:
coupling a control unit to a first data bus;
receiving first and second data packets in the control unit from the first data bus;

providing a plurality of processing units in data communication with the control unit over a first local data bus, independent of the first data bus, said processing units including at least one encryption processing unit and at least one authentication processing unit, the at least one authentication processing unit being coupled to the at least one encryption processing unit by a second local data bus separate from the first data bus and the first local data bus;

providing data of the first data packet from the control unit to said at least one encryption processing unit, over the first local data bus;

processing said data from the first data packet with said at least one encryption processing unit to provide output data for the first data packet from said at least one encryption processing unit;

communicating said output data for the first data packet from said at least one encryption processing unit to said at least one authentication processing unit via the second local data bus for further processing; and

providing data from the second data packet to said at least one encryption processing unit for processing by the at least one encryption processing unit, while said at least one authentication processing unit further processes the output data for the first data packet.

36. (New) A method of processing data in a computer, the method comprising the steps of:

performing encryption on a first data packet within an encryption processing unit; and

after completion of the encryption of the first data packet,

performing authentication of the first data packet within at least one authentication processing unit directly connected to the encryption processing unit by a local data bus, and

performing encryption of a second data packet within the encryption processing unit prior to completion of authentication of the first data packet.

37. (New) A method of processing data in a computer, the method comprising the steps of:

encrypting a first data packet with an encryption processing module;

authenticating the encrypted first data packet with a first authentication processing module;

encrypting a second data packet with the encryption processing module while authenticating the first data packet with the first authentication processing module directly connected to the encryption processing module by a local data bus; and

authenticating the second data packet with the first authentication processing module.

38. (New) An apparatus for processing data, comprising:
a computer having a data storage device connected thereto, wherein the data storage device stores a data;

one or more computer programs, performed by the computer, for performing encryption on a first data packet within an encryption processing unit, and, after completion of the encryption of the first data packet, performing authentication of the first data packet in at least one authentication processing unit directly connected to the encryption processing unit by a local data bus, and performing encryption of a second data packet within the encryption processing unit prior to completion of authentication of the first data packet.

39. (New) An apparatus for processing data, comprising:
a computer having a data storage device connected thereto, wherein the data storage device stores a data;

one or more computer programs, performed by the computer, for encrypting a first data packet with an encryption processing module, authenticating the encrypted first data packet with a first authentication processing module directly connected to the encryption processing module by a local data bus, encrypting a second data packet with the encryption processing module while authenticating the first data packet with the first authentication processing module, and authenticating the second data packet with the first authentication processing module.

40. (New) An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for processing data, the method comprising the steps of:

performing encryption on a first data packet with an encryption processing unit; and

after completion of the encryption of the first data packet,

performing authentication of the first data packet in at least one authentication processing unit directly connected to the encryption processing unit by a local data bus, and

performing encryption of a second data packet within the encryption processing unit prior to completion of authentication of the first data packet.

41. (New) An article of manufacture comprising a computer program carrier readable by a computer and embodying one or more instructions executable by the computer to perform method steps for processing data, the method comprising the steps of:

encrypting a first data packet with an encryption processing module; authenticating the encrypted first data packet with a first authentication processing module directly connected to the encryption processing unit by a local data bus;

encrypting a second data packet with the encryption processing module while authenticating the first data packet with the first authentication processing module; and

authenticating the second data packet with the first authentication processing module.

42. (New) A method of processing data packets comprising:
coupling a control unit to a first data bus;
receiving a first data packet in the control unit from the first data bus;
providing a plurality of processing units in data communication with the control unit over a first local data bus, independent of the first data bus, said processing units including at least one encryption processing unit and at least one authentication processing unit, the at least one encryption processing unit

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and the at least one authentication processing unit being coupled together by a second local data bus;

providing data of the first data packet from the control unit to multiple processing units, over the first local data bus;

processing said data from the first data packet with said multiple processing units in parallel.
